



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/849,503

05/20/2004

Gennadi Finkelshtain

P25226

5961

7055 7590 06/11/2009  
GREENBLUM & BERNSTEIN, P.L.C.  
1950 ROLAND CLARKE PLACE  
RESTON, VA 20191

EXAMINER

SIDDIQUEE, MUHAMMAD S

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

06/11/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com  
pto@gbpatent.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/849,503	<b>Applicant(s)</b> FINKELSHTAIN ET AL.	
	<b>Examiner</b> MUHAMMAD SIDDIQUEE	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-34 and 124-135 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 and 124-135 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/2/2009</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Applicant's amendment filed on 3/2/2008 was received. Claim 1 is amended, claims 35-123 are cancelled and claims 124-135 are added.

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-34 have been considered but are moot in view of the new ground(s) of rejection. Applicant amended the independent claim with new limitations and argued about that. Regarding applicant's arguments of fuel cell and the cartridge being separate devices in an uninstalled state, Hockaday teaches the fuel generator/cartridge as a separate device which is assembled with fuel cells [Fig. 1; paragraph 0017, 0097-0099]. Applicant asserted that when the cartridge and the fuel cell are connected fuel flows automatically. This is completely a functional language and does not add any structure to the apparatus and hence does not have any patentable weight.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1795

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-5, 7-15, 21-22, 26-34 and 124 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday et al (US 2001/0045364 A1).

Regarding claims 1 and 34, Hockaday discloses a disposable and a non-refillable, a rectangular shaped fuel cell system comprising a fuel cell (24, 20, 19, 17) having a hydrogen bubbling area (18) (variable volume chamber), a fuel tank (27) (cartridge or fuel generator) with wicking material (26), a membrane and wall (25). The wicking material within the fuel tank makes it a variable volume chamber. The fuel electrode (24) of the fuel cell elastically moves up and down and creates a variable

Art Unit: 1795

volume chamber. The membrane and filter wall (25) having small pores acts as a valve system which regulates fuel flow to the fuel cell. [Fig. 2; paragraph 0100-0102]. Due to its integral design and lack of any refueling port makes the fuel cell disposable and non-refillable. Hockaday also teaches that the cartridge or fuel generator can be a separate device to use with a fuel cell and automatically supply fuel to the fuel cell when connected together [Fig. 1; paragraph 0017, 0097-0099]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize a separate cartridge and install together with a fuel cell in order to have flexibility in handling, manufacturing and disposing of the fuel cells.

Regarding claims 2 and 9, Hockaday teaches that the variable volume chamber (18) is flexible because the fuel electrode elastically moves up and down which makes it flexible expandable and contractible chamber [Fig. 2; paragraph 0100].

Regarding claims 3-4, Hockaday teaches that electrolyte chamber comprises the electrolyte membrane (19) and the barrier layer(20) creates a definite volume chamber between air electrode (17) and the fuel electrode (24) [Fig. 2].

Regarding claims 5 and 10, Hockaday teaches that the wicking material within the fuel tank makes the variable volume chamber flexible expandable and contractible chamber [Fig. 2].

Regarding claims 7-8, Hockaday remains silent about fuel cell having flexible wall with folds. However, a flexible fuel chamber with fold is taught where fold is in the form of bellows [Fig. 6; paragraph 0115-0116]. The folds allow the chamber to flex in accordance with the amount of hydrogen required for distribution to the fuel cell. The

Art Unit: 1795

folds provide controlled points for the walls to expand and contract and therefore provide a control means for the direction the fuel cell expands and contracts. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize flexible wall with folds in the fuel cell in order to have flexible chamber as well as have a means to control the direction of expansion and contraction of the fuel chamber.

Regarding claims 11 and 14, Hockaday teaches that the fuel cartridge is non-removably connected to the fuel cell by an abutting connection [Fig. 2].

Regarding claims 12-13 and 15, Hockaday remains silent about using different types of sliding connections for a non-removable cartridge. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a sliding cradle or a rotational sliding connection as one of a limited number of alternatives for connection since these actions allow for the correct alignment of the two components mating and also allow for inaccessible detents that will lock the two components together.

Regarding claims 21-22, Hockaday teaches front and back covers and the variable volume chamber is disposed between them [Fig. 2-6]. Tank wall (27) can be considered as the front and back cover of the cartridge and the inside volume is variable due to the wicking material (26) within it [Fig. 2-6]. Also the wall of the container (38, 52, and 78) serves as a front and as a back cover [Fig. 3, 4, 6].

Regarding claim 26, Hockaday teaches that the fuel cell comprises a variable volume fuel chamber (18) where the fuel is stored and a electrolyte chamber comprises the electrolyte membrane (19) and the barrier layer (20) creates a definite volume chamber between air electrode (17) and the fuel electrode (24) [Fig. 2] and this electrolyte can expand and contract which makes it variable volume [paragraph 0103-0104].

Regarding claims 27-29 and 33, the pores in the membrane acts as a valve system. The first part of the pores is associated with the fuel cell and the second part of the pores is associated with the cartridge. The pores are insertable to each other and non-releasably connected to each other [Fig. 2; paragraph 0100-0102].

Regarding claims 30-32, Hockaday also teaches a valve to control fuel flow between the cartridge and the fuel cell which has closed and opened position and has the ability to prevent fluid flow between the first and the second part [Fig. 9; paragraph 0123]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize a valve system to control fluid flow between the fuel cell and the cartridge.

Regarding claim 124, in the fuel cell of Hockaday, cartridge/fuel generator/fuel tank is capable of having been prevented from being disconnected from the fuel cell and the fuel cell being prevented from being refilled. Further, for apparatus claims, the courts have held that if the prior art structure is capable of performing the intended use, then it meets the claim. Apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. The manner of operating an apparatus does

Art Unit: 1795

not differentiate an apparatus claim from the prior art, if the prior art apparatus teaches all of the structural limitations of the claim (see MPEP § 2114 & § 2173.05(g))

6. Claims 6 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday et al (US 2001/0045364 A1) as applied in claim 1 and further in view of Becerra et al (US 2003/0129464 A1) and Ohlsen et al (US 2004/0096721 A1).

Regarding claims 6 and 25, Hockaday remains silent about a variable/flexible electrolyte chamber in the fuel cartridge. However, Becerra discloses a fuel cell system comprising a fuel container having two variable/flexible fuel bladder (1205a, 1205b) [Fig. 12; paragraph 0058]. Becerra does not teach having electrolyte in the bladder, however, Ohlsen discloses a fuel cell system comprising a reactant supply component (318/218) having reactant reservoirs (326/226, 328/228) containing electrolyte [Fig. 3; paragraph 0037]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the teachings of providing electrolyte from a cartridge as taught by Ohlsen and two-chamber cartridge of Becerra/Ohlsen in the fuel cell of Hockaday in order to have longer shelf life since the electrolyte does not dry out and extra electrolyte may improve the interface between the cathode and the anode.

7. Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday et al (US 2001/0045364 A1) as applied in claim 1 and further in view of Lawrence et al (US 2002/0197522 A1).



Regarding claims 16-20, Hockaday remains silent about cover and cathode protection device. However, Lawrence discloses a fuel cell a fuel cell assembly comprising a membrane electrode assembly, an anode plate, a cathode plate, a fuel cartridge, and a fuel delivery system. The assembly also comprises an enclosure assembly (66) having frame and rim for assembling the fuel cell. The cathode plate (38, 38a) which serves as a front cover comprises plurality of air grooves (like a net) which serves as a cathode protection device [Fig. 1-3, 8-9]. It is apparent from the Fig. 2 that the frame, anode and cathode define a electrolyte chamber within the fuel cell.

Hockaday remains silent about fuel cell having flexible wall with folds. However, a flexible fuel chamber with fold is taught [Fig. 6; paragraph 0115-0116 ]. The folds allow the chamber to flex in accordance with the amount of hydrogen required for distribution to the fuel cell. The folds provide controlled points for the walls to expand and contract and therefore provide a control means for the direction the fuel cell expands and contracts. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize flexible wall with folds as taught in Hockaday and the cover and frame as taught by Lawrence in the fuel cell of Hockaday in order to have flexible chamber as well as have a means to control the direction of expansion and contraction of the fuel chamber and have a portable means and protection for the fuel cell.

8. Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday et al (US 2001/0045364 A1) as applied in claim 1 and further in view of Becerra et al (US 2003/0129464 A1).

Regarding claims 23-24, Hockaday is silent about a rigid backing plate. Becerra discloses fuel container for a fuel cell comprising a rigid backing plate with flexible wall to provide a supporting structure for the spring mechanism to push on so that the fuel can be retrieve from the bladder [Fig. 2-3; paragraph 0038-0040]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a backing plate along with the flexible bladder to provide a support for the bladder when pressure is applied.

9. Claims 125-128 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday et al (US 2001/0045364 A1) in view of Adams et al (US 2005/0022883 A1).

Regarding claims 128-128, the pores in the membrane can be interpreted as a valve system. However, valves used for regulating/controlling flow of fuel between cartridge and fuel cell are known in the art. Adams discloses a valve system where first part is connected with the cartridge and the second part is connected with the fuel cell. The cartridge valve has spring mechanism which prevents fluid from exiting out of the cartridge when not connected with fuel cell valve [Fig. 1; paragraph 0001, 0016, 0028, 0046]. The valve system is capable of preventing fuel cell from being refilled when they are connected to each other.

10. Claims 129-131 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday et al (US 2001/0045364 A1).

Regarding claims 129-135, Hockaday discloses a disposable and a non-refillable, a rectangular shaped fuel cell system comprising a fuel cell (24, 20, 19, 17) having a hydrogen bubbling area (18) (variable volume chamber), a fuel tank (27) (cartridge or fuel generator) with wicking material (26), a membrane and wall (25). The wicking material within the fuel tank makes it a variable volume chamber. The fuel electrode (24) of the fuel cell elastically moves up and down and creates a variable volume chamber. The membrane and filter wall (25) having small pores acts as a valve system which regulates fuel flow to the fuel cell. [Fig. 2; paragraph 0100-0102]. Due to its integral design and lack of any refueling port makes the fuel cell disposable and non-refillable. Hockaday also teaches that the cartridge or fuel generator can be a separate device to use with a fuel cell and automatically supply fuel to the fuel cell when connected together [Fig. 1; paragraph 0017, 0097-0099]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize a separate cartridge and install together with a fuel cell in order to have flexibility in handling, manufacturing and disposing of the fuel cells.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1795

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MUHAMMAD SIDDIQUEE whose telephone number is (571) 270-3719. The examiner can normally be reached on Monday-Thursday, 7:30 am to 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/849,503  
Art Unit: 1795

Page 12

/Muhammad Siddiquee/  
Examiner, Art Unit 1795

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795